



LINCOLN-WOODSTOCK COOPERATIVE SCHOOL DISTRICT COURSE SYLLABUS

Course Name: AP Physics II

Length: Full Year

Teacher: Katie Parent

Course Description: AP Physics 2 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through classroom study, in-class activity, and hands-on, inquiry-based laboratory work as they explore concepts like systems, fields, force interactions, change, conservation, and waves.

Competencies or Standards Assessed:

CR1 Students and teachers have access to college-level resources, including a college-level textbook and reference materials in print or electronic format.

CR2 The course provides opportunities to develop students' understanding of the required content outlined in each of the units described in the AP Physics 2 Course and Exam Description.

CR3 The course provides opportunities for students to develop the skills related to Science Practice 1: Creating Representations.

CR4 The course provides opportunities for students to develop the skills related to Science Practice 2: Mathematical Routines.

CR5 The course provides opportunities for students to develop the skills related to Science Practice 3: Scientific Questioning & Argumentation.

CR6 Students spend a minimum of 25% of instructional time engaged in hands-on laboratory investigations.

CR7 Students engage in hands-on laboratory investigations representative of the topics outlined in the AP Physics 2 Course and Exam Description.

CR8 The course provides opportunities for students to record evidence of their

scientific investigations in a portfolio of lab reports or a lab notebook (print or digital format).

Anchor Texts or Major Curriculum:

Course Outline (major units of study):

Unit Title	Essential Question or Overarching Understanding
Unit 9- Thermodynamics	Gases: Temperature, ideal gas law, speed distribution, kinetic theory First Law of Thermodynamics: internal energy, heating and work, PV diagrams, gas processes, specific heat, heating mechanisms Second Law of Thermodynamics: irreversible processes, entropy
Unit-10 Electric Force, Field, and Potential	Electric Charge, Force, and Energy: electrostatic interactions, conductors and insulators, Coulomb's law, electric potential energy The Electric Field: electric field, electric potential, capacitors
Unit- 11 Electric Circuits	DC Circuits: electric current, DC circuits, Ohm's law, power, Kirchhoff's rules, RC circuits, resistivity
Unit- 12 Magnetism and Electromagnetism	Magnetism: magnetic interactions, magnetic field, magnetic forces Electromagnetic Induction: magnetic flux, Faraday's law, Lenz's law, motional emf
Unit- 13 Geometric Optics	Reflection and Refraction: reflection, refraction, Snell's law, total internal reflection Mirrors and Lenses: image formation by mirrors and lenses, mirror equation, thin lens equation
Unit- 14 Waves, Sound, and Physical Optics	Mechanical Waves: mathematical description of a wave, wave interference, superposition, sound, Doppler effect, and standing waves



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	Wave Optics: Young's double-slit experiment, diffraction gratings, thin-film interference Electromagnetic Waves: electromagnetic spectrum, polarization, mathematical description of waves
Unit- 15 Modern Physics	Quantum Optics: blackbody radiation, photoelectric effect, De Broglie wavelength Atomic Physics: early atomic models, Bohr's model, spectral analysis Nuclear Physics: radioactivity, half-life, nuclear force, and binding energy, nuclear reactions, radioactive decay

Portrait of a Learner

Independent Learner

I make thoughtful plans and do my best to reach personal goals using feedback to work through challenges.

Responsible Collaborator

I work with others to achieve shared goals by listening actively, contributing ideas, and managing conflict.

Critical Thinker

I analyze information, ask thoughtful questions, and apply reasoning skills to solve problems and make decisions.

Effective Communicator

I express ideas clearly, adapting strategies based on the audience, setting, and/or purpose.

Global Citizen

I show that I care and take responsibility by helping in my community and the world around me.

Additional Classroom Expectations:

Laboratory Investigations

The AP Physics 2 course devotes over 25% of the time to laboratory investigations. The laboratory component of the course allows the students to demonstrate the three science practices through a variety of hands-on investigations in all of the units of study. CR6 Some labs focus on investigating a physical phenomenon without having expectations of its outcomes. In other experiments, the student expects the outcome based on concepts constructed from prior experiences. In application experiments, the students use acquired physics principles to address practical problems.

Students report all of the lab investigations in a laboratory journal. CR8